Plant Tissue Culture Basal Salts & Media Formulations

All components expressed in mg/L	Anderson Basal Salt Mixture	Banana AGS Medium	Blaydes Modified Basal Medium	Chu N6 Basal Medium w/ Vitamins	Cape Sundew/ Venus Fly Trap Multip. Medium	Carrot Callus Initiation medium	Cape Sundew/ Venus Fly Trap Pretransplant Medium	Carrot Shoot Development medium	Chee & Pool C2d Vitis Medium
COMPONENT	**A267**	**B144**	**B514**	**C167**	**C206**	**C212**	**C216**	**C222**	**C287**
Ammonium Nitrate	400.0	1,650.0	1,000.0		400.0		825.0		1,650.0
Ammonium Sulfate				463.0		134.0		134.0	
Boric Acid	6.20	6.20	1.60	1.60	6.20	3.00	3.10	3.00	6.20
Calcium Chloride, Anhydrous	332.20	333.0		125.330	332.20	113.240	166.50	113.24	
Calcium Nitrate			241.10						492.30
Cobalt Chloride·$6H_2O$	0.0250	0.0250			0.0250	0.0250	0.0125	0.0250	0.0250
Cupric Sulfate·$5H_2O$	0.0250	0.0250			0.0250	0.0250	0.0125	0.0250	0.0250
Na_2 EDTA·$2H_2O$	74.50		74.50	37.25	74.50	37.26		37.26	37.30
Ferric Sodium EDTA		36.70					18.350		
Ferrous Sulfate·$7H_2O$	55.70		55.70	27.85	55.70	27.80		27.80	27.80
Magnesium Sulfate, Anhydrous	180.70	181.00	17.10	90.370	180.70	122.090	90.50	122.090	180.60
Manganese Chloride·$4H_2O$									
Manganese Sulfate·H_2O	16.90	16.90	4.40	3.30	16.90	10.0	8.450	10.0	0.845
Sodium Molybdate(VI)·$2H_2O$	0.250	0.250			0.250	0.250	0.125	0.250	0.250
Potassium Chloride			100.0						
Potassium Iodide	0.300	0.830	0.800	0.800		0.750	0.415	0.750	
Potassium Nitrate	480.0	1,900.0	65.0	2,830.0	480.0	2,500.0	950.0	2,500.0	1,900.0
Potassium Phosphate, Dibasic									
Potassium Phosphate, Monobasic, Anhydrous		170.0	300.0	400.0			85.0		170.0
Sodium Phosphate Monobasic·H_2O	330.6	295.0			380.0	150.0		150.0	
Zinc Sulfate·$7H_2O$	8.60	8.60	1.50	1.50	8.60	2.000	4.30	2.00	8.60
Adenine Hemisulfate·$2H_2O$					80.0				
2,4-Dichlorophenoxyacetic Acid						1.0			
6-γ,γ-Dimethylallylaminopurine (2IP)		10.0			1.0				
Glycine			2.0	2.0					
Indole-3-acetic Acid		1.000							
Kinetin								0.200	
myo-Inositol		100.0			100.0	100.0	50.0	100.0	10.0
Nicotinic Acid				0.50		1.0		1.0	1.0
Pyridoxine·HCl				0.50		1.0		1.0	1.0
Sucrose			30,000						
Thiamine·HCl		0.40	0.10	1.0	0.40	10.0	0.20	10.0	1.0
Grams of powder to prepare 1 liter	1.890	4.710	31.860	3.990	2.120	3.210	2.200	3.210	4.490
pH±0.5 at RT	3.75	4.75	NS	4.00	3.50	4.00	5.00	4.00	4.00

NS = No Specification Established

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Plant Tissue Culture Basal Salts & Media Formulations (cont.)

All components expressed in mg/L	Chu N6 Basal Salt Mixture	DCR Basal Salt Mixture	DKW Basal Salt Mixture w/ Sucrose	DKW Basal Salt Mixture	DKW Basal Salt Mixture W/ 10.0 g/L Sucrose	EXS IIIa™ Basal Medium	EXS III™ Basal Medium	Economou & Read Basal Medium	Gamborg (PRL-4-DM) Long Medium
COMPONENT	**C416**	**D146**	**D189**	**D190**	**D191**	**E333**	**E337**	**E575**	**G359**
Ammonium Nitrate		400.0	1,416.0	1,416.0	1,416.0	Proprietary Formulation	Proprietary Formulation	400.0	
Ammonium Sulfate	463.0							132.0	200.0
Boric Acid	1.60	6.20	4.80	4.80	4.80			6.20	3.00
Calcium Chloride, Anhydrous	125.330	64.140	112.50	112.50	112.50			332.20	113.240
Calcium Nitrate		386.310	1,367.0	1,367.0	1,367.0				
Cobalt Chloride·6H_2O		0.0250						0.0250	0.250
Cupric Sulfate·5H_2O		0.250	0.250	0.250	0.250			0.0250	0.250
Na_2 EDTA·2H_2O	37.25	37.30	45.40	45.40	45.40				186.0
Ferrous Sulfate·7H_2O	27.85	27.80	33.80	33.80	33.80				139.0
Iron Chelate, Sequestrene® 330								56.0	
Magnesium Sulfate, Anhydrous	90.370	180.70	361.490	361.490	361.490			180.70	122.090
Manganese Sulfate·H_2O	3.30	22.30	33.50	33.500	33.50			16.90	132.0
Sodium Molybdate(VI)·2H_2O		0.250	0.390	0.390	0.390			0.250	0.250
Nickel Chloride·6H_2O		0.025							
Nickel Sulfate·6H_2O			0.005	0.005	0.005				
Potassium Chloride									300.0
Potassium Iodide	0.800	0.830							0.750
Potassium Nitrate	2,830.0	340.0						202.0	1,000.0
Potassium Phosphate, Monobasic, Anhydrous	400.0	170.0	265.0	265.0	265.0			408.0	
Potassium Sulfate			1,559.0	1,559.0	1,559.0				
Sodium Phosphate Monobasic·H_2O									90.0
Zinc Nitrate·6H_2O			17.0	17.0	17.0				
Zinc Sulfate·7H_2O	1.50	8.60						8.60	3.0
p-Aminobenzoic Acid									0.20
L-Arginine (Free Base)									40.0
L-Ascorbic Acid									0.40
Asparagine									40.0
D-Biotin									0.00025
Calcium Pantothenate									0.40
Choline Chloride									0.20
Folic Acid									0.015
L-Glutamine									60.0
Glycine									20.0
myo-Inositol								100.0	100.0
Methionine									30.0
Nicotinic Acid									0.50
L-Phenylalanine									20.00
Pyridoxine·HCl									0.50
Riboflavin, Vit. B_2									0.015
Sucrose			30,000		10,000				
Thiamine·HCl								0.40	0.50
L-Tryptophan									40.0
Grams of powder to prepare 1 liter	4.0	1.640	35.220	5.220	15.220	3.950	3.870	1.840	3.30
pH±0.5 at RT	4.25	4.00	4.00	4.00	4.00	4.00	4.75	NS	3.75

NS = No Specification Established

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Plant Tissue Culture Basal Salts & Media Formulations (cont.)

All components expressed in mg/L	Gresshoff & Doy Basal Slat Mixture	Gamborg B-5 Basal Medium	Gamborg Basal Salt Mixture	Hoagland Modified Basal Salt Mixture	Heller Basal Salt Mixture	Heller/ White Modified Basal Salt Mixture	Hosta Initiation/ Multiplication Medium	Hosta Multiplication Medium	Hosta Rooting Medium
COMPONENT	**G371**	**G398**	**G768**	**H353**	**H393**	**H396**	**H435**	**H436**	**H437**
Aluminum Chloride·6H_2O					0.054	0.030			
Ammonium Nitrate	1,000.0						1,650.0	1,650.0	1,650.0
Ammonium Phosphate, Monobasic				115.03					
Ammonium Sulfate		134.0	134.0						
Boric Acid	0.30	3.0	3.0	2.86	1.0	1.24	6.20	6.20	6.20
Calcium Chloride, Anhydrous		113.240	113.240		56.70		332.20	332.20	332.20
Calcium Nitrate	241.20			656.40		300.0			
Cobalt Chloride·6H_2O	0.0250	0.0250	0.0250				0.0250	0.0250	0.0250
Cupric Sulfate·5H_2O	0.0250	0.0250	0.0250	0.080	0.030	0.030	0.0250	0.0250	0.0250
Na_2 EDTA·2H_2O	37.25	37.26	37.26	3.53			37.26	37.26	37.26
Ferric Chloride					1.0				
Ferric Sulfate·XH_2O						25.0			
Ferrous Sulfate·7H_2O	27.85	27.80	27.80	2.50			27.80	27.80	27.80
Magnesium Sulfate, Anhydrous	17.099	122.090	122.090	240.760	122.10	351.630	180.70	180.70	180.70
Manganese Chloride·4H_2O				1.810					
Manganese Sulfate·H_2O	1.0	10.0	10.0		0.076	0.010	16.90	16.90	16.90
Sodium Molybdate(VI)·2H_2O	0.025	0.250	0.250				0.250	0.250	0.250
Molybdenum Trioxide				0.016					
Nickel Chloride·6H_2O					0.030	0.030			
Potassium Chloride	65.0				750.0	65.0			
Potassium Iodide	0.8	0.750	0.750		0.010	0.010	0.830	0.830	0.830
Potassium Nitrate	1,000.0	2,500.0	2,500.0	606.60		80.0	1,900.0	1,900.0	1,900.0
Potassium Phosphate, Monobasic, Anhydrous	300.0						300.0	300.0	300.0
Sodium Nitrate					600.0				
Sodium Phosphate Monobasic·H_2O		150.0	150.0		108.8	16.5	170.0	170.0	170.0
Sodium Sulfate						200.0			
Zinc Sulfate·7H_2O	0.30	2.0	2.0	0.220	1.0	1.0	8.60	8.60	8.60
Adenine Hemisulfate·2H_2O							160.0	160.0	
Agar							8,000.0	8,000.0	8,000.0
6-Benzylaminopurine							2.000	0.100	0.100
D-Biotin	0.200								
Casein, Enzymatic Hydrolysate							500.0	500.0	500.0
Glycine	4.0						2,000.0	2,000.0	
myo-Inositol	10.0	100.0					100.0	100.0	100.0
α-Naphthaleneacetic Acid							0.500	0.500	0.500
Nicotinic Acid	0.10	1.0							
Pyridoxine·HCl	0.10	1.0							
Sucrose							30,000	30,000	30,000
Thiamine·HCl	1.0	10.0					0.40	0.40	0.40
Grams of powder to prepare 1 liter	2.710	3.210	3.10	1.630	1.640	1.040	43.40	43.390	43.230
pH±0.5 at RT	4.00	4.00	4.00	4.75	4.90	4.70	4.30	4.30	4.30

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Plant Tissue Culture Basal Salts & Media Formulations (cont.)

All components expressed in mg/L	Kao & Michayluk Basal Salt Mixture	Kao & Michayluk Modified Basal Medium	Lloyd and McCown Woody Plant Basal Salt Mixture.	Lloyd and McCown Woody Plant Micronut. Mixture	Lloyd and McCown Woody Plant Medium	Linsmaier & Skoog Basal Medium, Buffered & pH Adjusted	Linsmaier & Skoog Basal Medium	Linsmaier & Skoog Basal Med. w/ 30 g/L Sucrose, pH Adjusted & Buffered	Linsamaier and Skoog Basal Medium (MSMO)
COMPONENT	**K413**	**K427**	**L154**	**L444**	**L449**	**L452**	**L467**	**L473**	**L477**
Ammonium Nitrate	600.0	600.0	400.0		400.0	1,650.0	1,650.0	1,650.0	1,650.0
Boric Acid	3.0	3.0	6.20	6.20	6.20	6.20	6.20	6.20	6.20
Calcium Chloride, Anhydrous	453.0	453.0	72.50	72.50	72.50	332.20	332.20	332.20	332.20
Calcium Nitrate			386.0		386.0				
Cobalt Chloride·$6H_2O$	0.0250	0.0250				0.0250	0.0250	0.0250	0.0250
Cupric Sulfate·$5H_2O$	0.0250	0.0250	0.2500	0.2500	0.2500	0.0250	0.0250	0.0250	0.0250
Na_2 EDTA·$2H_2O$	37.26	37.26	37.30	37.30	37.30	37.26	37.26	37.26	37.26
Ferrous Sulfate·$7H_2O$	27.85	27.85	27.90	27.85	27.90	27.80	27.80	27.80	27.80
Magnesium Sulfate, Anhydrous	146.550	146.550	180.70	180.70	180.70	180.70	180.70	180.70	180.70
Manganese Sulfate·H_2O	10.0	10.0	22.30	22.30	22.30	16.90	16.90	16.90	16.90
Sodium Molybdate(VI)·$2H_2O$	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250
Potassium Chloride	300.0	300.0							
Potassium Hydroxide						100.0		100.0	100.0
Potassium Iodide	0.750	0.750				0.830	0.830	0.830	0.830
Potassium Nitrate	1,900.0	1,900.0				1,900.0	1,900.0	1,900.0	1,900.0
Potassium Phosphate, Monobasic, Anhydrous	170.0	170.0	170.0	170.0	170.0	170.0	170.0	170.0	170.0
Potassium Sulfate			990.0		990.0				
Zinc Sulfate·$7H_2O$	2.0	2.0	8.60	8.60	8.60	8.60	8.60	8.60	8.60
Agar						7,000.0	7,000.0		
p-Aminobenzoic Acid		0.020							
L-Ascorbic Acid		2.0							
D-Biotin		0.010							
Calcium Pantothenate		1.0							
Cholecalciferol, Vit. D_3		0.010							
Choline Chloride		1.0							
Citric Acid, Anhydrous		40.0							
Cyanocobalamin, Vit B_{12}		0.020							
Folic Acid		0.4							
Fumaric Acid		40.0							
Glycine					2.0				
L-Malic Acid		40.0							
MES (Free Acid)						1,000.0		1,000.0	1,000.0
myo-Inositol		100.0			100.0	100.0	100.0	100.0	100.0
Niacinamide		1.00							
Nicotinic Acid					0.50				
Pyridoxine·HCI		1.00			0.50				
Pyruvic Acid, Potassium Salt		20.0							
Retinol, Vit. A		0.010							
Riboflavin, Vit. B_2		0.20							
Sucrose						30,000	30,000	30,000	
Thiamine·HCI		1.00			1.00	0.40	0.40	0.40	0.40
Grams of powder to prepare 1 liter	3.650	3.90	2.30	0.530	2.410	42.530	41.430	35.530	5.530
pH±0.5 at RT	4.00	3.50	4.00	4.00	4.00	5.75	4.75	5.75	5.75

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Plant Tissue Culture Basal Salts & Media Formulations (cont.)

All components expressed in mg/L	Litvay Basal Salt Mixture	Linsamaier and Skoog Basal Medium (MSMO)	MS Modified Basal Salt Mixture (1/2x Micros & Macros)	MS Modified Basal Salt Mixture	MS Modified Medium w/ BA & NAA	MS Modified Basal Medium w/ Gamborg Vitamins	MS Modified Basal Salt Mixture (No N, P, or K)	MG Mediuim (Modified MS/ Gamborg Medium)	Musa (Banana) Multiplication Medium
COMPONENT	**L546**	**L689**	**M153**	**M290**	**M401**	**M404**	**M407**	**M419**	**M462**
Ammonium Nitrate	1,650.0	1,650.0	825.0	825.0	1,650.0	1,650.0			1,650.0
Ammonium Sulfate								33.5	
Boric Acid	31.0	6.20	3.10	6.20	6.20	6.20	6.20	2.30	6.20
Calcium Chloride, Anhydrous	16.610	332.20	166.10	166.10	332.20	332.20	332.20	111.360	332.20
Cobalt Chloride·$6H_2O$	0.1250	0.0250	0.0125	0.0250	0.0250	0.0250	0.0250	0.0125	0.0250
Cupric Sulfate·$5H_2O$	0.50	0.0250	0.0125	0.0250	0.0250	0.0250	0.0250	0.0125	0.0250
Na_2 EDTA·$2H_2O$		37.26	18.63	37.26	37.26	37.26	37.26	18.64	37.25
Ferric Sodium EDTA	36.700								
Ferrous Sulfate·$7H_2O$		27.80	13.90	27.80	27.80	27.80	27.80	13.90	27.85
Magnesium Sulfate, Anhydrous	903.380	180.700	90.350	180.70	180.70	180.70	180.70	75.700	180.740
Manganese Sulfate·H_2O	21.00	16.90	8.450	16.90	16.90	16.90	16.90	6.70	16.90
Sodium Molybdate(VI)·$2H_2O$	1.250	0.250	0.125	0.250	0.250	0.250	0.250	0.125	0.250
Potassium Iodide	4.150	0.830	0.415	0.830	0.830	0.830	0.830	0.40	0.830
Potassium Nitrate	1,900.0	1,900.0	950.0	950.0	1,900.0	1,900.0		1,100.0	1,900.0
Potassium Phosphate, Monobasic, Anhydrous	340.0	170.0	85.0	170.0	170.0	170.0		42.5	170.0
Sodium Nitrate								437.80	
Sodium Phosphate Monobasic·H_2O								32.6	
Zinc Sulfate·$7H_2O$	43.00	8.60	4.30	8.60	8.60	8.60	8.60	2.700	8.60
L-Ascorbic Acid									20.0
6-Benzylaminopurine					1.0				4.500
Gellan Gum (CultureGel™)									2,000.0
Glycine					2.0				2.0
Indole-3-acetic Acid									0.175
myo-Inositol		100.0			100.0	100.0			
α-Naphthaleneacetic Acid					0.10				
Nicotinic Acid					0.50	1.00			0.50
Pyridoxine·HCI					0.50	1.00			0.50
Sucrose					30,000				30,000
Thiamine·HCI		0.40			0.40	10.0			0.40
Grams of powder to prepare 1 liter	4.950	4.430	2.170	2.390	34.440	4.440	0.610	1.880	36.360
pH±0.5 at RT	4.75	4.00	4.25	4.00	4.00	4.00	4.00	4.30	4.25

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Plant Tissue Culture Basal Salts & Media Formulations (cont.)

All components expressed in mg/L	Murashige Modified Shoot Multiplication Basal Medium	MS Modified Basal Salt Mixture w/ FeNaEDTA	MS Macronutrient Salt Base	Murashige & Skoog Basal Salt Mixture - Finer & Nagasawa Modification	Murashige Modified Fern Multiplication Basal Medium	Murashige Modified Gerbera Multiplication Basal Medium	Murashige Modified Gerbera Pretransplant Basal Medium	Murashige Modified Kalanchoe Multplication Basal Medium	Murashige Modified Kalanchoe Pre-transplant Basal Medium
COMPONENT	**M491**	**M499**	**M502**	**M504**	**M508**	**M509**	**M510**	**M511**	**M512**
Ammonium Nitrate	1,650.0	1,650.0	1,650.0	825.0	1,650.0	1,650.0	1,650.0	1,650.0	1,650.0
Boric Acid	6.20	6.20		6.20	6.20	6.20	6.20	6.20	6.20
Calcium Chloride, Anhydrous	333.0	333.0	332.20	332.20	333.0	333.0	333.0	333.0	333.0
Cobalt Chloride·$6H_2O$	0.0250	0.0250		0.0250	0.0250	0.0250	0.0250	0.0250	0.0250
Cupric Sulfate·$5H_2O$	0.0250	0.0250		0.0250	0.0250	0.0250	0.0250	0.0250	0.0250
Ferric Sodium EDTA	36.70	36.70		36.70	36.70	36.700	36.70	36.70	36.70
Magnesium Sulfate, Anhydrous	181.0	181.0	180.70	180.540	181.0	181.0	181.0	181.0	181.0
Manganese Sulfate·H_2O	16.900	16.90		16.90	16.90	16.90	16.90	16.90	16.90
Sodium Molybdate(VI)·$2H_2O$	0.250	0.250		0.250	0.250	0.250	0.250	0.250	0.250
Potassium Iodide	0.830	0.830		0.830	0.830	0.830	0.830	0.830	0.830
Potassium Nitrate	1,900.0	1,900.0	1,900.0	3,030.0	1,900.0	1,900.0	1,900.0	1,900.0	1,900.0
Potassium Phosphate, Monobasic, Anhydrous	170.0	170.0	170.0	170.0	170.0	170.0	170.0	170.0	170.0
Sodium Phosphate Monobasic·H_2O	170.0				255.0	85.0	85.0		
Zinc Sulfate·$7H_2O$	8.60	8.60		8.60	8.60	8.60	8.60	8.60	8.60
Adenine Hemisulfate·$2H_2O$	80.0					80.0			
6-γ,γ-Dimethylallylaminopurine (2IP)	30.0							3.0	
Indole-3-acetic Acid	0.30					0.50	10.0		3.0
Kinetin					2.000	10.0			
myo-Inositol	100.0				100.0	100.0	100.0	100.0	100.0
α-Naphthaleneacetic Acid					0.100				
Nicotinic Acid						10.00	10.0		
Pyridoxine·HCl						1.00	1.00		
Thiamine·HCl	0.40				0.40	30.0	30.0	0.40	0.40
L-Tyrosine, Free Base						100.0	100.0		
Grams of powder to prepare 1 liter	4.680	4.30	4.230	4.610	4.660	4.720	4.640	4.410	4.410
pH±0.5 at RT	4.90	4.75	4.75	NS	4.75	4.00	4.25	4.75	4.75

NS = No Specification Established

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Plant Tissue Culture Basal Salts & Media Formulations (cont.)

All components expressed in mg/L	Murashige Modified Lily Multiplication Basal Medium	MS Modified BC Potato Basal Medium	Murashige Modified African Violet/ Gloxinia Multiplication Basal Medium	Murashige Modified African Violet/ Gloxinia Pretransplant Basal Medium	Murashige & Skoog Basal Medium	Murashige & Skoog (MS) Basal Salt Mixture	Murashige Modified Multiplication Basal Medium w/ Kinetin & IAA	MS Micronutrient Stock Solution (10x)	MS Modified Basal Medium Buffered w/ MES
COMPONENT	**M513**	**M516**	**M517**	**M518**	**M519**	**M524**	**M527**	**M529**	**M530**
Ammonium Nitrate	1,650.0	1,650.0	1,650.0	1,650.0	1,650.0	1,650.0	1,650.0		1,650.0
Boric Acid	6.20	6.20	6.20	6.20	6.20	6.20	6.20	62.00	6.20
Calcium Chloride, Anhydrous	333.0	333.0	333.0	333.0	332.20	332.20	333.0		332.20
Cobalt Chloride·$6H_2O$	0.0250	0.0250	0.0250	0.0250	0.0250	0.0250	0.0250	0.250	0.0250
Cupric Sulfate·$5H_2O$	0.0250	0.0250	0.0250	0.0250	0.0250	0.0250	0.0250	0.250	0.0250
Na_2 EDTA·$2H_2O$					37.26	37.26		373.0	37.26
Ferric Sodium EDTA	36.700	36.700	36.700	36.700			36.700		
Ferrous Sulfate·$7H_2O$					27.80	27.80		278.0	27.80
Magnesium Sulfate, Anhydrous	181.0	181.0	181.0	181.0	180.70	180.70	181.0		180.70
Manganese Sulfate·H_2O	16.90	16.90	16.90	16.90	16.90	16.90	16.90	169.0	16.90
Sodium Molybdate(VI)·$2H_2O$	0.250	0.250	0.250	0.250	0.250	0.250	0.250	2.500	0.250
Potassium Iodide	0.830	0.830	0.830	0.830	0.830	0.830	0.830	8.300	0.830
Potassium Nitrate	1,900.0	1,900.0	1,900.0	1,900.0	1,900.0	1,900.0	1,900.0		1,900.0
Potassium Phosphate, Monobasic, Anhydrous	170.0	170.0	170.0	170.0	170.0	170.0	170.0		170.0
Sodium Phosphate Monobasic·H_2O			170.0						
Zinc Sulfate·$7H_2O$	8.60	8.60	8.60	8.60	8.60	8.60	8.60	86.0	8.60
Adenine Hemisulfate·$2H_2O$			80.0						
Glycine		2.0			2.0				2.0
Indole-3-acetic Acid			2.0	1.0			0.30		
Kinetin		0.040	2.0				1.0		
MES (Free Acid)									1,000.0
myo-Inositol	100.0	100.0	100.0	100.0	100.0		100.0		100.0
α-Naphthaleneacetic Acid	0.030								
Nicotinic Acid		0.50			0.50				0.50
Pyridoxine·HCl		0.50			0.50				0.50
Thiamine·HCl	0.40	0.40	0.40	0.40	0.10		0.40		0.10
Grams of powder to prepare 1 liter	4.400	4.410	4.660	4.400	4.430	4.330	4.410	NA	5.430
pH±0.5 at RT	4.75	4.75	4.00	4.75	3.90	4.00	4.75	3.00	NS

NS = No Specification Established

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Plant Tissue Culture Basal Salts & Media Formulations (cont.)

All components expressed in mg/L	MS Modified Basal Salt Mixture (No Nitrogen)	MS Modified Basal Medium	Murashige Modified Multiplication Basal Medium w/ 2iP	MS Modified Basal Medium (w/out KH2PO4)	MS Modified Medium (Arabidopsis)	MS Micronutrient Salt Base	MS Modified Multiplication Medium w/ Kinetin	MS Modified Basal Salt Mixture (1/2x Nitrates)	MS Modified Basal Salt Mixture (No NH_4NO_3)
COMPONENT	**M531**	**M535**	**M536**	**M541**	**M550**	**M554**	**M555**	**M561**	**M571**
Ammonium Nitrate		1,650.0	1,650.0	1,650.0	1,650.0		1,650.0	825.0	
Boric Acid	6.20	6.20	6.20	6.20	6.20	6.20	6.20	6.20	6.20
Calcium Chloride, Anhydrous	332.20	332.20	332.20	332.20	332.20		332.20	332.20	332.20
Cobalt Chloride·$6H_2O$	0.0250	0.0250	0.0250	0.0250	0.0250	0.0250	0.0250	0.0250	0.0250
Cupric Sulfate·$5H_2O$	0.0250	0.0250	0.0250	0.0250	0.0250	0.0250	0.0250	0.0250	0.0250
Na_2 EDTA·$2H_2O$	37.26	37.26	37.26		37.26	37.26	37.26	37.26	37.26
Ferric Sodium EDTA				36.70					
Ferrous Sulfate·$7H_2O$	27.80	27.80	27.80		27.80	27.80	27.80	27.80	27.80
Magnesium Sulfate, Anhydrous	180.70	180.70	180.70	180.70	180.70		180.70	180.70	180.70
Manganese Sulfate·H_2O	16.90	16.90	16.90	16.90	16.900	16.90	16.90	16.90	16.90
Sodium Molybdate(VI)·$2H_2O$	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250
Potassium Iodide	0.830	0.830	0.830	0.830	0.830	0.830	0.830	0.830	0.830
Potassium Nitrate		1,900.0	1,900.0	1,900.0	1,900.0		1,900.0	950.0	1,900.0
Potassium Phosphate, Monobasic, Anhydrous	170.0	170.0	170.0		170.0		170.0	170.0	170.0
Sodium Phosphate Monobasic·H_2O			170.0	300.0			148.0		
Zinc Sulfate·$7H_2O$	8.60	8.60	8.60	8.60	8.60	8.60	8.60	8.60	8.60
Adenine Hemisulfate·$2H_2O$		80.0	80.0	150.0			80.0		
Casein, Enzymatic Hydrolysate				1,000.0					
2,4-Dichlorophenoxyacetic Acid					2.0				
Glycine			2.0	2.0					
Kinetin					0.050		1.0		
myo-Inositol		100.0	100.0	100.0	100.0		100.0		
α-Naphthaleneacetic Acid							0.100		
Nicotinic Acid			0.50	5.0	1.0				
Pyridoxine·HCl			0.50	1.0	1.0				
Sucrose					20,000		30,000		
Thiamine·HCl		0.40	0.40	0.50	10.0		0.40		
Grams of powder to prepare 1 liter	0.780	4.510	4.680	5.690	24.440	0.10	34.660	2.560	2.680
pH±0.5 at RT	4.00	3.75	4.75	4.75	3.75	4.00	3.75	4.00	4.00

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Plant Tissue Culture Basal Salts & Media Formulations (cont.)

All components expressed in mg/L	MS Basal Salt Concentrate (20x)	MS Macronutrient Stock Solution (10x)	MS Modified Basal Medium w/ 2iP	MS Modified Medium w/ 2iP & IAA	NLN Medium	NB Basal Medium	Nitsch & Nitsch Basal Salt Mixture	Nitsch & Nitsch Basal Medium	Parker-Thompson Basic C Fern Medium
COMPONENT	**M576**	**M654**	**M701**	**M702**	**N479**	**N492**	**N613**	**N616**	**P713**
Ammonium Molybdate									0.037
Ammonium Nitrate	33,000.0	16,500.0	1,650.0	1,650.0			720.0	720.0	125.0
Ammonium Sulfate						463.0			
Boric Acid	124.0		6.20	6.20	10.0	3.00	10.0	10.0	1.86
Calcium Chloride, Anhydrous	6,644.0	3,322.0	333.0	332.20		125.330	166.0	166.0	19.628
Calcium Nitrate					345.0				
Cobalt Chloride·$6H_2O$	0.50		0.0250	0.0250	0.0250	0.0250			
Cupric Sulfate·$5H_2O$	0.50		0.0250	0.0250	0.0250	0.0250	0.0250	0.0250	0.370
Na_2 EDTA·$2H_2O$	745.20			37.26		37.26	37.26	37.26	37.30
Ferric Sodium EDTA			36.70		36.70				
Ferrous Sulfate·$7H_2O$	556.0			27.80		27.80	27.80	27.80	27.80
Magnesium Sulfate, Anhydrous	3,614.0	1,810.0	181.0	180.70	61.0	90.370	90.372	90.372	58.565
Manganese Sulfate·H_2O	338.0		16.900	16.900	18.950	10.0	18.90	18.90	0.250
Sodium Molybdate(VI)·$2H_2O$	5.0		0.250	0.250	0.250	0.250	0.250	0.250	
Potassium Iodide	16.60		0.830	0.830		0.750			
Potassium Nitrate	38,000.0	19,000.0	1,900.0	1,900.0	125.0	2,830.0	950.0	950.0	
Potassium Phosphate, Monobasic, Anhydrous	3,400.0	1,700.0	170.0	170.0	125.0	400.0	68.0	68.0	500.0
Sodium Phosphate Monobasic·H_2O				148.0					
Zinc Sulfate·$7H_2O$	172.0		8.60	8.60	10.0	2.0	10.0	10.0	0.520
Adenine Hemisulfate·$2H_2O$			30.0	80.0					
D-Biotin					0.050			0.050	
6-γ,γ-Dimethylallylaminopurine (2IP)			10.0	30.0					
Folic Acid					0.50			0.50	
L-Glutamine					800.0				
Glutathione (Reduced), Sodium Salt					30.0				
Glycine					2.0			2.0	
Indole-3-acetic Acid			1.0	0.30					
myo-Inositol			100.0	100.0	100.0	100.0		100.0	
Nicotinic Acid					5.00	1.0		5.00	
Pyridoxine·HCl					0.50	1.0		0.50	
L-Serine					100.0				
Sucrose				30,000					
Thiamine·HCl			0.40	0.40	0.50	10.0		0.50	
Grams of powder to prepare 1 liter	N/A	N/A	4.440	34.690	1.770	4.10	2.10	2.210	0.770
pH±0.5 at RT	3.25	4.25	4.25	4.00	4.75	4.00	4.00	4.80	4.00

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Plant Tissue Culture Basal Salts & Media Formulations (cont.)

All components expressed in mg/L	Quoirin & Lepoivre Basal Salt Mixture	Rose Initiation Medium	Rose Multiplication Medium	Rose Rooting Medium	Schenk & Hildebrandt Modified Basal Salts	Schenk & Hildebrandt Modified Basal Salts	Schenk & Hildebrandt Basal Salts w/ Sucrose	Schenk & Hildebrandt Modified Basal Medium	Schenk & Hildebrandt Basal Salts
COMPONENT	**Q673**	**R756**	**R757**	**R758**	**S806**	**S808**	**S811**	**S813**	**S816**
Ammonium Nitrate	400.0	1,650.0	1,650.0	412.50					
Ammonium Phosphate, Monobasic					300.0	150.0	300.0	300.0	300.0
Boric Acid	6.20	6.20	6.20	1.550	5.00	2.50	5.00	5.00	5.00
Calcium Chloride, Anhydrous		333.0	333.0	83.250		75.50	151.0	151.0	151.0
Calcium Nitrate	833.770								
Cobalt Chloride·$6H_2O$	0.0250	0.0250	0.0250	0.0063	0.10	0.050	0.10	0.10	0.10
Cupric Sulfate·$5H_2O$	0.0250	0.0250	0.0250	0.0063	0.20	0.10	0.20	0.20	0.20
Na_2 EDTA·$2H_2O$	37.30				20.00	10.0	20.0	20.0	20.0
Ferric Sodium EDTA		36.70	36.70	9.175					
Ferrous Sulfate·$7H_2O$	27.80				15.0	7.50	15.0	15.0	15.0
Magnesium Sulfate, Anhydrous	175.790	181.0	181.0	45.250	195.40	97.70	195.40	195.40	195.40
Manganese Sulfate·H_2O	0.760	16.90	16.90	4.225	10.0	5.0	10.0	10.0	10.0
Sodium Molybdate(VI)·$2H_2O$	0.250	0.250	0.250	0.063	0.10	0.050	0.10	0.10	0.10
Potassium Iodide	0.080	0.830	0.830	0.208	1.0	0.5	1.0	1.0	1.0
Potassium Nitrate	1,800.0	1,900.0	1,900.0	475.0	2,500.0	1,250.0	2,500.0	2,500.0	2,500.0
Potassium Phosphate, Monobasic, Anhydrous	270.0	170.0	170.0	42.5					
Zinc Sulfate·$7H_2O$	8.60	8.60	8.60	2.150	1.0	0.50	1.0	1.0	1.0
L-Ascorbic Acid		50.0	50.0						
6-Benzylaminopurine		2.0	3.0						
Citric Acid, Anhydrous		50.0	50.0						
Glycine		2.0	2.0	2.0					
Indole-3-acetic Acid		0.30	0.30						
myo-Inositol		100.0	100.0	100.0		500.0		1,000.0	
α-Naphthaleneacetic Acid				0.030					
Nicotinic Acid		0.50	0.50	0.50		2.50		5.00	
Pyridoxine·HCl		0.50	0.50	0.50		0.25		0.50	
Sucrose						10,000	10,000	10,000	
Thiamine·HCl		0.40	0.40	0.40		2.50		5.00	
Grams of powder to prepare 1 liter	3.560	4.510	4.510	1.180	3.050	12.10	13.20	14.210	3.200
pH±0.5 at RT	4.00	3.50	3.50	5.00	4.25	4.50	4.25	4.25	4.50

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Plant Tissue Culture Basal Salts & Media Formulations (cont.)

All components expressed in mg/L	TM4G Basal Salts	Tobacco Callus Initiation Medium	Tobacco Root Initiation Medium	Tobacco Shoot Multiplication Medium	Tobacco Shoot & Root Medium	TM4G Basal Medium	Westvaco WV3 Medium	Westvaco WV5 Medium	White Basal Salt Mixture
COMPONENT	**T853**	**T856**	**T861**	**T864**	**T867**	**T868**	**W863**	**W865**	**W898**
Ammonium Nitrate	320.0	1,650.0	1,650.0	1,650.0	1,650.0	320.0		700.0	
Ammonium Phosphate, Monobasic	230.0					230.00			
Ammonium Sulfate	130.0					130.0			
Boric Acid	6.20	6.20	6.20	6.20	6.20	6.20	31.00	31.00	1.50
Calcium Chloride, Anhydrous	113.250	333.0	333.0	333.0	333.0	113.250	452.880	452.880	
Calcium Nitrate									208.50
Cobalt Chloride·$6H_2O$	0.0250	0.0250	0.0250	0.0250	0.0250	0.0250	0.0250	0.0250	
Cupric Sulfate·$5H_2O$	0.0250	0.0250	0.0250	0.0250	0.0250	0.0250	0.2500	0.2500	0.0010
Na_2 EDTA·$2H_2O$	18.65					18.65			
Ferric Sodium EDTA		36.70	36.70	36.70	36.70		36.700	36.70	
Ferrous Sulfate·$7H_2O$	13.90					13.90			2.50
Magnesium Sulfate, Anhydrous	122.124	181.0	181.0	181.0	181.0	122.124	903.790	903.790	351.620
Manganese Sulfate·H_2O	16.90	16.90	16.90	16.90	16.90	16.90	15.160	15.160	5.310
Sodium Molybdate(VI)·$2H_2O$	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	
Molybdenum Trioxide									0.001
Potassium Chloride							656.790	718.670	65.0
Potassium Iodide	0.830	0.830	0.830	0.830	0.830	0.830	0.830	0.830	0.750
Potassium Nitrate	1,900.0	1,900.0	1,900.0	1,900.0	1,900.0	1,900.0	910.06	1,084.06	80.0
Potassium Phosphate, Monobasic, Anhydrous		170.0	170.0	170.0	170.0		270.0	270.0	
Sodium Nitrate									16.50
Sodium Phosphate Monobasic·H_2O									200.0
Zinc Sulfate·$7H_2O$	9.20	8.60	8.60	8.60	8.60	9.20	8.60	8.60	3.0
D-Biotin						0.050			
Casein, Enzymatic Hydrolysate		1,000.0	1,000.0	1,000.0	1,000.0				
Folic Acid						0.50			
Glycine		2.0	2.0	2.0	2.0	2.50			
Indole-3-acetic Acid		2.0	3.0		0.030				
Kinetin		0.20		1.0	1.0				
myo-Inositol		100.0	100.0	100.0	100.0	100.0	1,000.0	1,000.0	
Nicotinic Acid		0.50	0.50	0.50	0.50	5.00			
Pyridoxine·HCI		0.50	0.50	0.50	0.50	0.50			
Thiamine·HCI		0.40	0.40	0.40	0.40	0.50	0.40	0.40	
Grams of powder to prepare 1 liter	2.880	5.410	5.410	5.410	5.410	2.990	4.290	5.220	0.930
pH±0.5 at RT	4.25	5.50	5.50	5.50	5.50	4.25	4.75	4.75	4.75

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